

Tritium Extraction Facility

Mission

The Tritium Extraction Facility (TEF) is being constructed at the Savannah River Site (SRS) to supply tritium, a radioactive form of hydrogen necessary for the nation's nuclear weapons stockpile. TEF is part of the National Nuclear Security Administration's (NNSA) Defense Programs operations at SRS

The NNSA's Tritium Readiness Program has produced Tritium Producing Burnable Absorber Rods (TPBARs). The TPBARs will be irradiated in Tennessee Valley Authority's Watts Bar or Sequoyah nuclear reactors and then transported to SRS, where the tritium will be safely and efficiently extracted in the TEF. The tritium will be piped to the existing Tritium Loading Facility at SRS for further purification prior to loading into reservoirs for shipment to the Department of Defense.

Background

Since 1988, when the last heavy water reactor at SRS ceased production, the nation has had no source for tritium production. Current stockpile requirements have been met by recovering the gas from dismantled nuclear weapons and from routine tritium reservoir exchanges from the existing nuclear stockpile.

In December 1998, the Department of Energy (DOE) announced that commercial reactors would be the primary source for tritium production. In May 1999, DOE selected the Tennessee Valley Authority's Watts Bar Unit 1, Sequoyah Unit 1, and/or Sequoyah Unit 2 CLWRs for irradiating the DOE-supplied TPBARs. In October 2003, the first TPBARs were inserted in TVA's Watts Bar reactor for irradiation.

Project Description

The TEF is being built in the SRS H Area. A staff of approximately 400 workers will be employed during peak construction, and after completion the facility will have an operations staff of approximately 100 permanent employees.

There will be three major structures—the Remote Handling Building (RHB), Tritium Processing Building (TPB) and Tritium Support Building.

The RHB is where the TPBARs will be unloaded and the tritium gas extracted. The RHB has a truck receiving area, cask decontamination area, TPBAR and waste preparation area, furnaces, hot maintenance area, and associated gloveboxes for extraction pumps and tanks. It also includes an overhead crane and remote handling equipment.

The TPB will provide preliminary purification of the extracted gases prior to transfer to Building 233-H. It is a single story facility, approximately 125 feet wide by 155 feet long, built above ground. The TPB houses the main control room, crane control room and miscellaneous rooms for gas analysis and radiation control activities.

The Tritium Support Building will house management and support staff as well as change rooms, maintenance support areas and a loading dock.

Current Status

Construction of TEF began in 2000 and is now approximately 84% complete. The exteriors of TEF's two major buildings, the Remote Handling Building and the Tritium Processing Building are complete. Outfitting the interior of both buildings is under way, including equipping \$12M worth of gloveboxes for the safe handling of tritium gases. Gloveboxes have been installed in the facility, and some have been turned over to Startup for testing. The balance of the gloveboxes will be turned over by November 2004. Installation continues on items such as fire protection, cable and cable tray, the Integrated Control Systems and the processing equipment and storage systems in the remote processing cell.

Startup testing of the HVAC and electrical distribution is in progress. Startup testing of process equipment began in May 2004 with the turnover of some of the gloveboxes. Currently 27 of 81 systems have been turned over to Startup for testing.

Inert gas testing is expected to begin in FY05 with approval to begin normal operations forecast for FY07.

